East Australian Current Region
Oceanographic conditions report

November 2013

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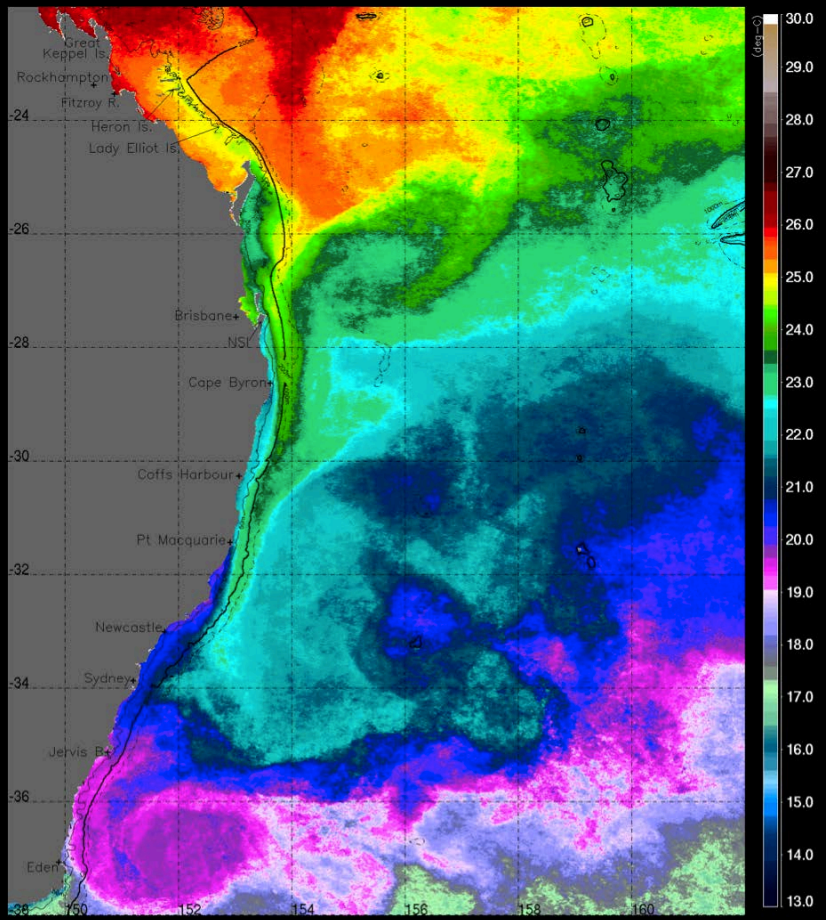
Overview: November 2013

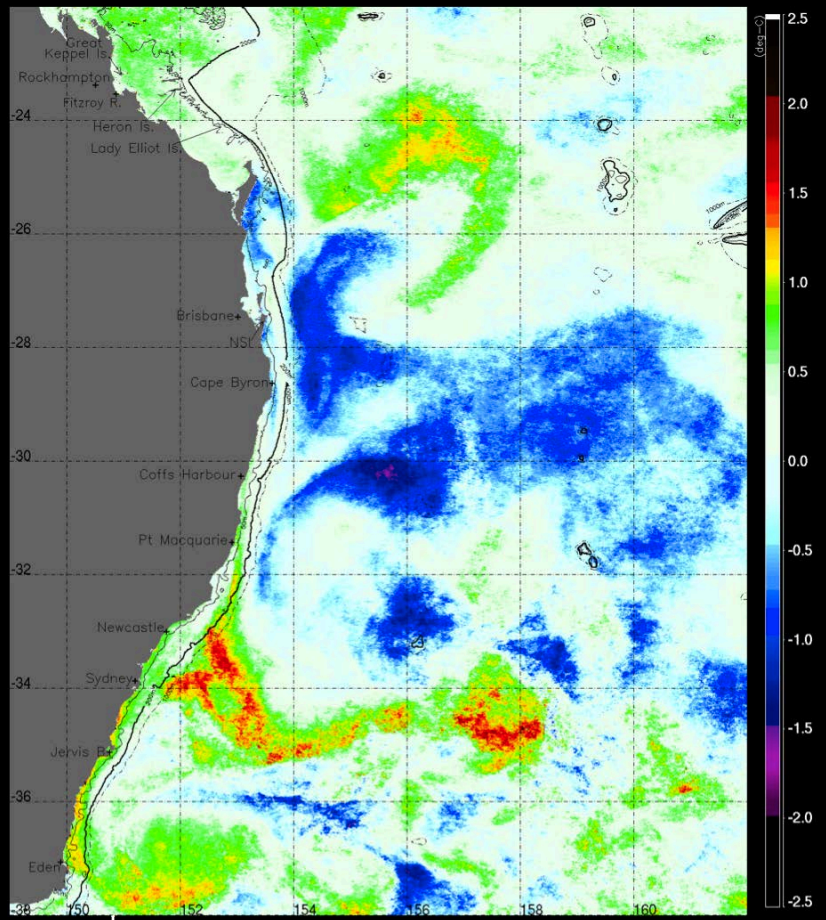
- MODIS monthly sea surface temperature (SST) means & anomalies showing an intensified 'anomalous' East Australian Current (EAC) and strong eddy activity in the region.
- Weekly MODIS chlorophyll means show offshore advection of shelf waters
- Weekly maps of sea level anomalies showing the ocean topography related to the EAC and eddy activity in the region consistent with MODIS images.
- Monthly mean surface oceanic currents (OceanMAPS) show maximum current (1.23 m/s) coincident with an anticyclonic eddy.

EAC monthly MODIS SST (D+N): November 2013

- Seasonal increase in temperature of the Current
- Strong positive SST anomalies corresponding to the:
  - EAC as it leaves Marion Plateau
  - Southern EAC limb advecting offshore from Port Macquarie
  - Southern coastal flow component of large anticyclonic eddy off Eden
- Moderate to intense negative SST anomalies offshore mostly between 26-34°S
- Moderate negative SST anomalies also apparent on shelf south of Fraser Island



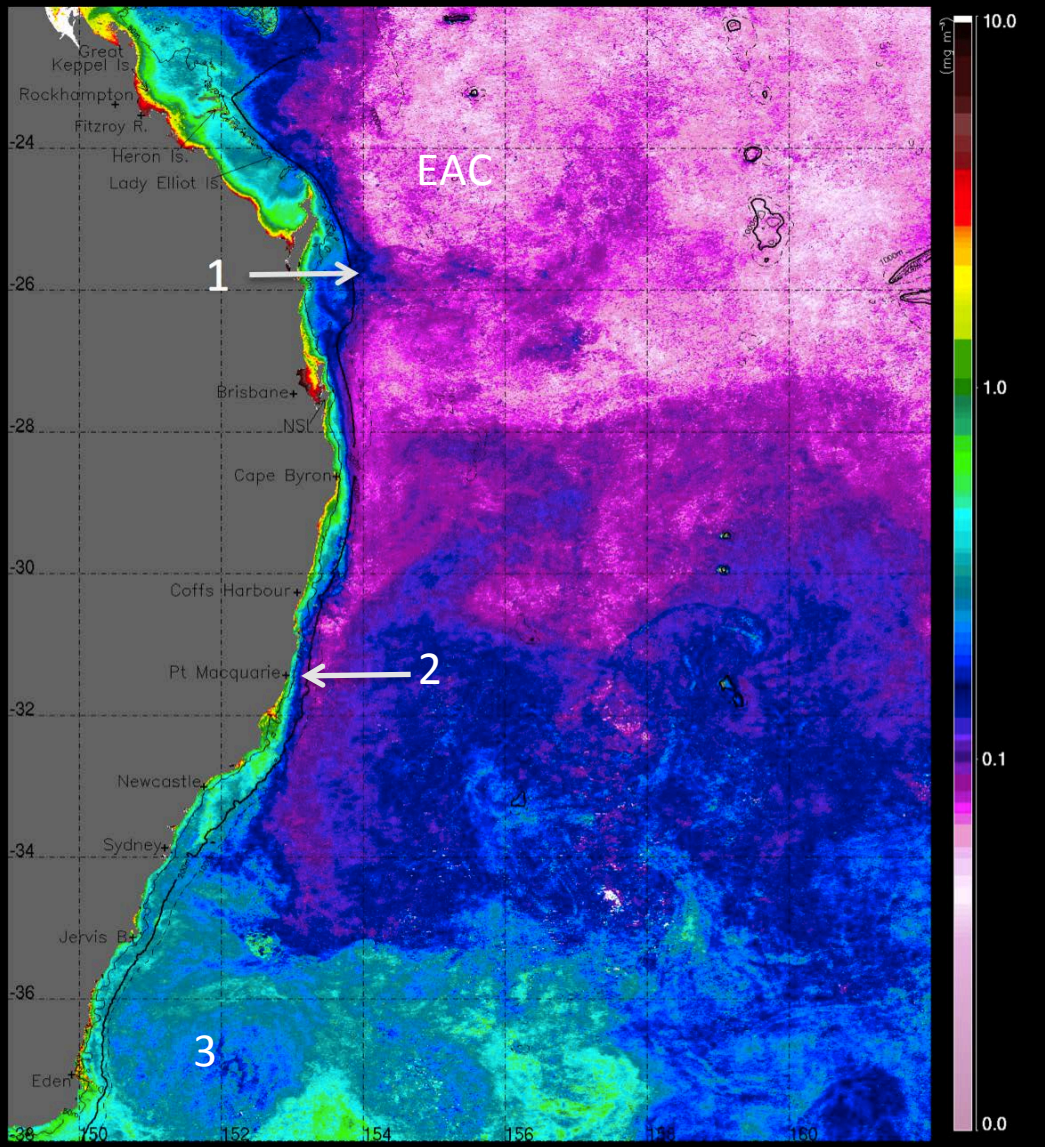
mean



anomaly

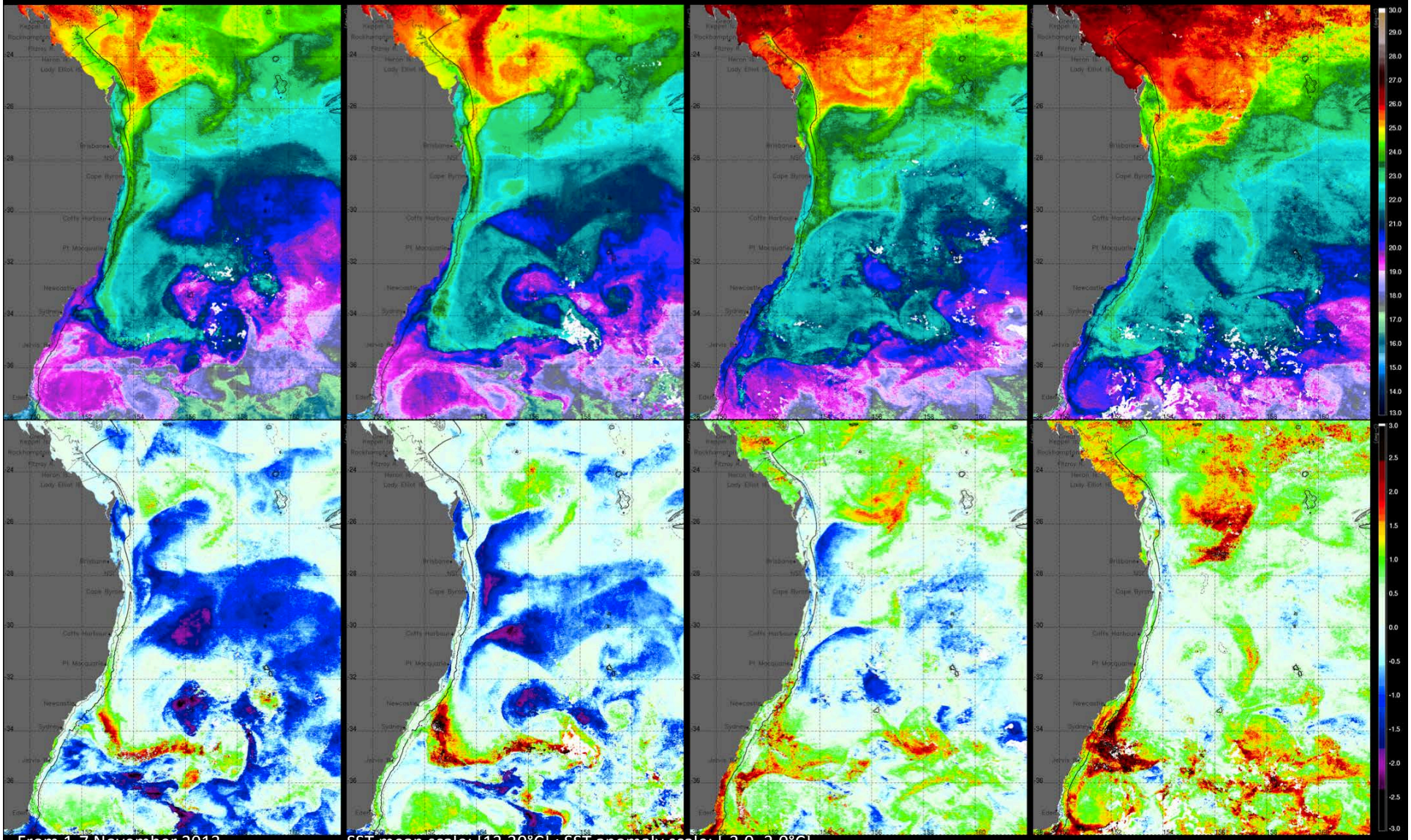
EAC monthly MODIS Chlorophyll-*a*: November 2013

- 1 : Offshore advection of shelf waters with relatively higher chlorophyll concentration due to EAC anticyclonic eddy off Fraser coast. (See weekly chlorophyll images in subsequent slides for further details.)
- 2 : High chlorophyll concentration coincident with upwelled waters inshore of the primary EAC flow
- 3 : Large anticyclonic eddy that has persisted since beginning September 2013. Elevated chlorophyll levels corresponding to frontal boundaries between warm core eddy and temperate Tasman Sea waters.



November 2013 Weekly MODIS SST means (top panel) and anomalies (bottom panel)

- Moderate positive SST anomalies along the southern limb of the EAC (from ~33°S), increasing in intensity and southward extent during Weeks 3 & 4.
- Intense negative SST anomalies offshore during Weeks 1 & 2



From 1-7 November 2013

SST mean scale: [13,30°C] ; SST anomaly scale: [-3.0, 3.0°C]

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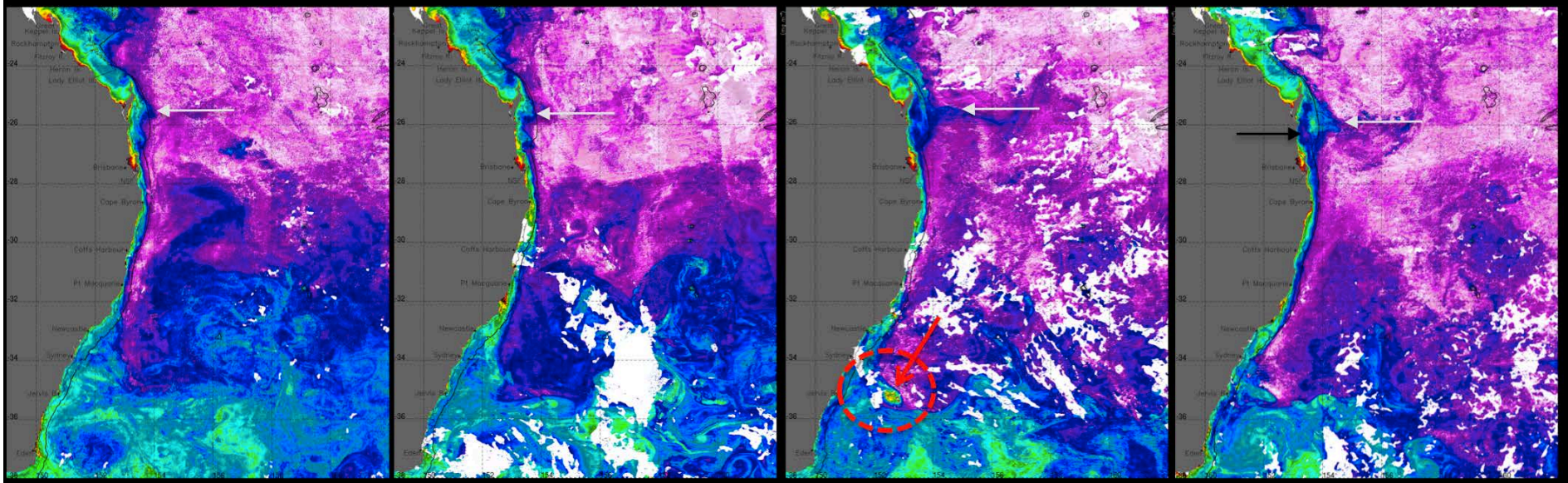
November 2013 Weekly MODIS CHLOR means

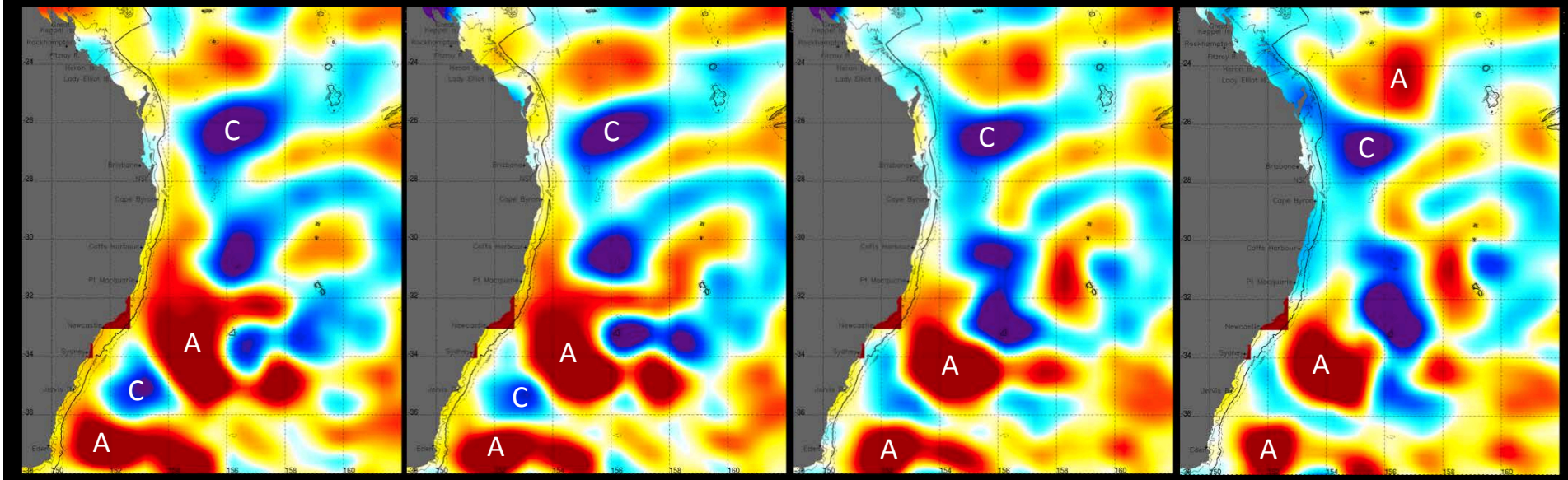
- Surface manifestation of an active Capricorn Eddy towards Week 4
- Offshore advection of high chlorophyll shelf waters progressively intensifying towards the end of the month (white arrow)
- Intrusion of oceanic oligotrophic waters (black arrow) onto shelf south of Fraser due to spin up of a cyclonic eddy at Week 4
- Entrainment of pre-conditioned high chlorophyll shelf waters into a small cyclonic eddy at Week 3 (red arrow)



From 1-7 November 2013

Weekly AVISO Maps of Sea Level Anomalies

- Corresponding maps of sea level anomalies from AVISO show the primary EAC flow 'impacted' by a cyclonic eddy that moved westward between 26-28°S from Weeks 1 - 4.
- See next OceanMaps slide clearly showing EAC veered eastward around this cyclonic eddy before continuing southward



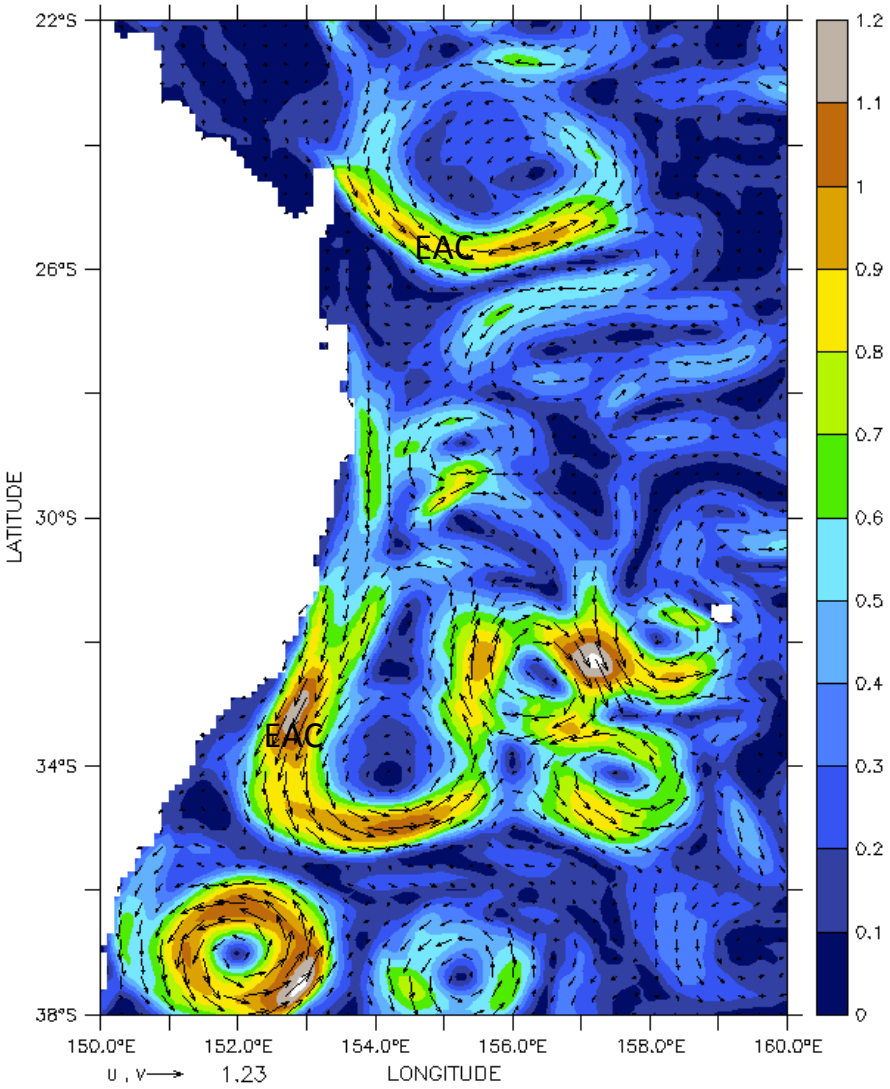
From 1-7 November 2013

A: anticyclonic eddy; C = cyclonic eddy

OceanMaps 15m Depth Integrated Currents
November 2013

Depth integrated (0-15m) currents from OceanMaps reveal:

- EAC 'veered' eastward off Fraser coast feeding a large anticyclonic eddy
- Intensified EAC from ~31°S exceeding 1.2ms^{-1} with high eddy activity as it continued into the Tasman front
- Persistent large anticyclonic eddy centred at 37°S and 152°E with maximum current velocity of 1.23 ms^{-1}



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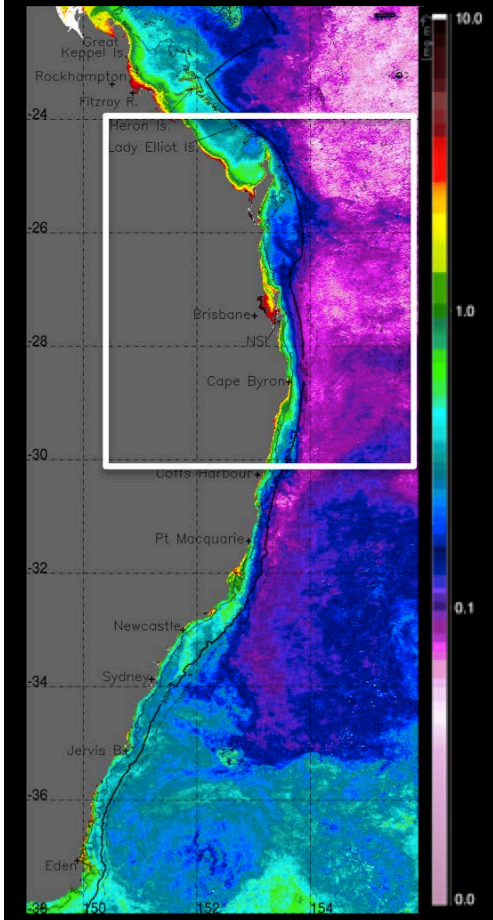
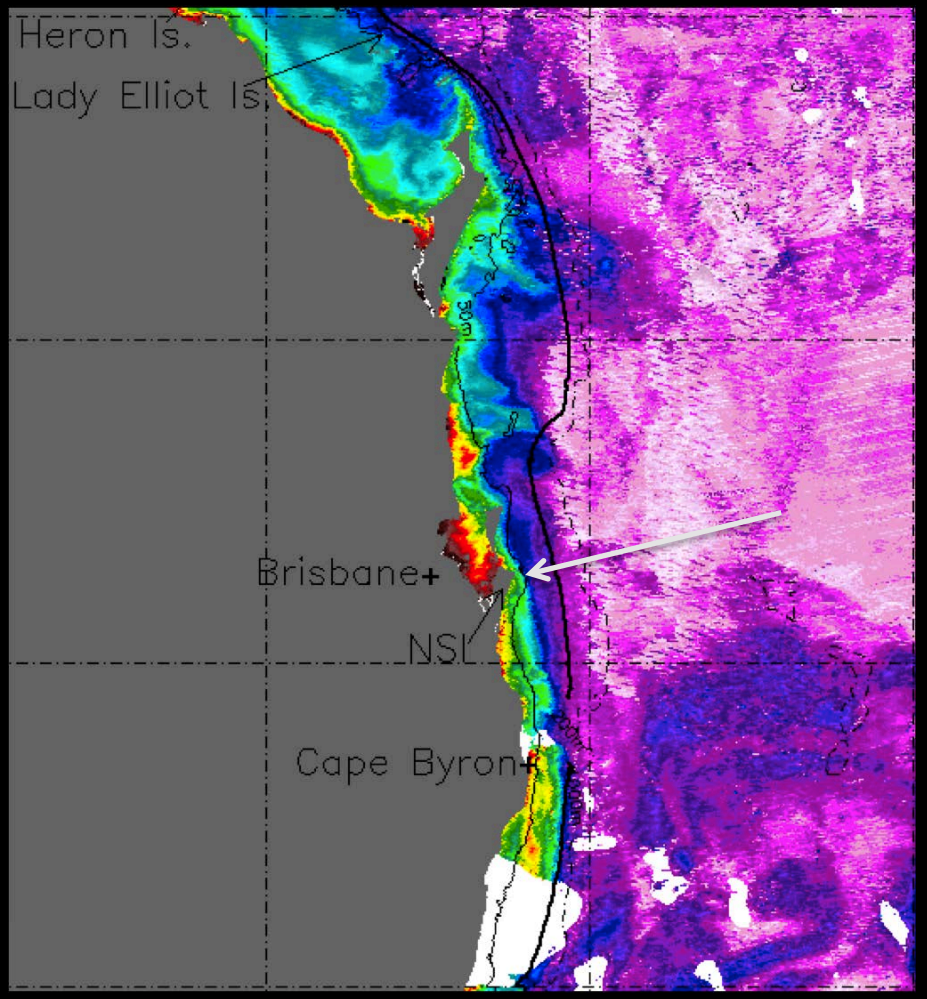
Manta sightings @ Stradbroke Island in November 2013



Monthly mean chlorophyll (November 2013)

3D mean, 9-11 November 2013



Manta feeding off North Stradbroke Island at strong front between EAC encroachment onto the shelf ('bluish-purplish' waters along the 50m isobath) and high inshore chlorophyll.